REMARKS/ARGUMENTS

Applicants have amended Claim 3. No new matter was added by this amendment. Claims 1-3 and 5-11 remain in this application. Applicants request reconsideration of this application in view of the above amendment and these remarks.

Allowable Subject Matter

The Examiner has objected to Claim 8 as being dependent upon a rejected base claim (Claim 1) but has stated that this claim would be allowable if rewritten in independent form including all of the limitations of the base claim. Based on the arguments below, Applicants believe that Claim 1 (from which Claim 8 depends) is allowable and that, therefore, Claim 8 is allowable by virtue or its dependency on an allowable base claim. Thus, Applicants have not amended Claim 8.

Claim Rejections – 35 USC § 103

The Examiner has rejected Claims 1-3, 5-7 and 9-11 under 35 U.S.C. 103(a) as being unpatentable over Wong (USPN 6,037,985) in view of Hamanaka (USPN 6,603,883). Applicants traverse these rejections.

To establish a *prima facie* case of obviousness, and hence to find Claims 1-3, 5-7 and 9-11 unpatentable under 35 U.S.C. § 103(a) over the combination of Wong and Hamanaka, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all of the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not be based upon applicant's disclosure. MPEP at § 2142. In the present case, all three criteria are not met because there is no motivation to modify the Wong reference with the Hamanaka reference as suggested by the Examiner, and the combined teachings of the Wong and Hamanaka references do not teach or suggest all of the claim limitations of Claim 1-3, 5-7 and 9-11.

Turning first to Claim 1, the Examiner argues that "Wong [at col. 6, lines 10-60] discloses a method of enhancing a video bit stream using temporal scalability, wherein the peak signal-to-noise ratios of bidirectionally predicted pictures [are] determined with reference to the peak signal-to-noise ratios of other pictures . . . as in claim 1". Applicants respectfully disagree with the Examiner. The Wong reference seeks to provide macroblock-level (MB-level) bit allocation using a trade-off of picture average quality and local distortion within a picture (col. 3, lines 16-18). The disclosed method uses a multipass (three pass) technique wherein MBs within a picture are processed a multiple number of times to select the best set of quantization scales (Qs), also referred to therein as bit count, for the MBs by striking a balance between the average picture quality (indicated by the peak-signal-to-noise ratio (PSNR)) and local distortion (as indicated by as immunity to quantization noise measurement) (col. 3, line 65 to col. 4, lines 1-7, 19-25; and col. 6, line 47).

Thus, the focus of Wong is bit allocation in MBs for improved video encoding. This references discloses nothing about determining "peak signal-to-noise ratios of bidirectionally predicted pictures in an enhancement layer . . . with reference to the peak signal-to-noise ratios of [other] pictures" as is recited in Claim 1, not even in col. 6, lines 10-60 cited by the Examiner. As stated above, the method disclosed in the Wong reference processes each picture in three passes to optimize a set of Q values for the picture (col. 4, lines 24-25), and col. 6, lines 10-60 discloses some of the detail of the first and second passes of the three-pass technique. More particularly, the first pass aims at finding an initial MB-level bit allocation according to the sensitivity of the picture to quantization noise (col. 4, lines 59-61) using a quantization noise immunity equation at col. 5, lines 66-67 and using the observation that a MB with a low value based on the equation should be assigned a low value of Q, and a MB with a high value based on the equation may be assigned a high Q value (col. 6, lines 13-16). Col. 6, lines 1-25 include an explanation of the variables included in the quantization noise immunity equation, and also introduces a table that is used to map the values output from the equation to a Q value for a given MB.

It should be noted that the only mention of bidirectionally predicted pictures in the entire passage cited by the Examiner (i.e., col. 6, lines 10-60) is in connection with this table that gives the mapping of quantization noise immunity values to Q values for MBs that are included in B-pictures. Col. 6, lines 26-60 discloses how the Q values determined in the first pass are then readjusted in the second pass to make sure that the overall bit count for the entire picture does not exceed a predetermined target bit count for the picture. There is no mention of determining peak signal-to-noise ratios (PSNRs) of bidirectionally predicted pictures anywhere in this passage. In fact, the only mention of PSNR is a teaching of computing *PSNR for each MB* in the first pass for use in the second pass, and computing MB-level PSNR and overall PSNR at the end of the second pass to group MBs for the third pass (col. 6, lines 23-25 and 48-51).

The Examiner concedes that "Wong fails to explicitly disclose the use of base layer and enhancement picture information for determining the peak signal-to-noise ratios, as in the claim [1]" but argues that the Hamanaka reference discloses these limitations. The Examiner then argues that "it would have been obvious for one of ordinary skill in the art [to] incorporate the base layer/enhancement layer configuration of Hamanaka into the Wong method in order to have the Wong teaching satisfy various resolution requirements of the receiving equipment". Applicants disagree with the Examiner. Besides missing limitations, the combined teachings of the Wong and Hamanaka references do not render Claim 1 obvious because modifying Wong to incorporate the requirement of Claim 1 that the PSNRs of B-pictures (bidirectionally predicted pictures) in an enhancement layer are determined with reference to PSNRs of pictures in another layer would change the principle of operation of the Wong reference. Thus, there is no motivation to modify the Wong reference with the Hamanaka reference as the Examiner suggests in the Office Action.

Stated advantages of the Wong method result from the method limiting its analysis to the MB-level *within a single picture* and, thus, not looking at information outside of the picture (let alone in another layer altogether) to address problems in the prior art. More

particularly, Wong describes a prior art method of bit allocation, wherein "the number of bits to code a picture is set a priori without looking at the content of the picture" (col. 2, lines 43-44). Wong further states that "[this] rate control scheme cannot take advantage of the variation in coding complexity *within a picture* . . . possibly [and undesirably] resulting in large quality variations *within a picture*" (col. 3, lines 2-5). The Wong invention addresses this problem by using certain content *within the picture itself* to determine bit allocation. Specifically, Wong states "the present invention provides macroblock-level (MB-level) bit allocation using a tradeoff of picture average quality and local distortion *within the picture*" (col. 3, lines 17-19). That the disclosed invention is based on single layer processing within a picture is further clarified in the following language, wherein Wong discloses that "in particular, the preferred embodiments limit look-ahead *to just within a picture*, that is, the encoder is allowed to process the MBs within a picture . . . a multiple number of times. . . The preferred embodiments process each picture in three passes to find the set of Q-values for the MBs in the picture" (col. 3, lines 63-67; col. 4, lines 24-25). Thus, it would not have been obvious to one skilled in the art to modify Wong to include some sort of base layer/enhancement layer analysis in the Wong method because it would have changed the principle operation of this reference, which required just looking within a picture.

Regarding Claim 2, the Examiner states "the Wong method, now incorporating the Hamanaka base layer/enhancement layer signal configuration, has wherein the number of bits allocated to encode a bidirectionally predicted picture of an enhancement is determined with reference to the number of bits used to encode a picture of another layer (Wong: column 7, lines 1-39)". Applicants disagree. Similar to Applicants argument above with respect to Claim 1, Wong cannot be modified by Hamanaka to supply missing limitations regarding base layer and enhancement layer limitations of Claim 2. Applicants further submit that the Wong reference fails to disclose, even in col. 7, lines 1-39 recited by the Examiner, the limitations recited in Claim 2 of "the number of bit allocated to encode a

bidirectionally predicted picture of an enhancement layer is determined with reference to the number of bits used to encode [another] picture".

As explained above, Wong teaches that MB-level bit allocation within a picture is determined based on two factors, PSNR of the picture and local distortion within the picture (col. 3, lines 16-19). Further as explained above, a picture is processed in three passes to find a set of Q values (bit count) for the MBs in the picture (col. 4, lines 24-25). In the first pass, initial Q values for the MBs are assigned. In the second pass, those initial Q values are adjusted (increased or decreased) based on the discrepancy between the overall bit count assigned to the picture in the first pass and a target bit count (col. 6, lines 37-39). Col. 7, lines 1-39 explains in some detail how the bit count of the MBs are adjusted if the Residual is positive (overall bit count is less than the target bit count) and if the Residual is negative (overall bit count is more than the target bit count). Where the Residual is positive, Wong determined that a larger portion of the surplus bits is spent on MBs that have low PSNR than on those that already have high PSNR (col. 7, lines 14-18). Where the Residual is negative, Wong determined that fewer bits should be taken from MBs with lower Q values (col. 7, lines 21-25).

Regarding Claim 3, the Examiner states that "Wong discloses a method of enhancing a video bit stream using temporal scalability, wherein temporal positions of predicted picture [are] determined to be spaced evenly with reference to temporal positions of other pictures (Wong: column 6, lines 1-26)" and that "it would have been obvious for one of ordinary skill in the art [to] incorporate the base layer/enhancement layer configuration of Hamanaka into the Wong method in order to have the Wong teaching satisfy various resolution requirements of the receiving equipment". Applicants disagree with the Examiner. Similar to Applicants argument above with respect to Claim 1, Wong cannot be modified by Hamanaka to supply missing limitations regarding base layer and enhancement layer limitations of Claim 3. Applicants further submit that Wong fails to disclose, even in col. 6, lines 1-26 recited by the Examiner, the limitations recited in Claim 3 of "temporal positions of bidirectionally predicted pictures in an enhancement layer are

determined to be spaced evenly with reference to temporal positions of [other] pictures". As argued above, disclosed in col. 6, lines 1-25 is an explanation of the variables included in the quantization noise immunity equation, and also a table that's used to map the values output from the equation to Q values for the MBs within a picture. This passage has nothing whatsoever to do with determining temporal positions of bidirectionally predicted pictures.

Applicants further submit that the combined teachings of Wong and Hamanaka do not render Claims 5-7 and 9-11 obvious for reasons above with respect to Claims 1 through 3. Therefore, since limitations are missing from the Wong and Hamanaka references and since there is no motivation to modify the Wong reference with the Hamanaka reference, a rejection of Claims 1-3, 5-7 and 9-11 under 35 U.S.C. § 103(a) is improper and should be withdrawn.

The Applicants believe that the subject application, as amended, is in condition for allowance. Such action is earnestly solicited by the Applicants.

In the event that the Examiner deems the present application non-allowable, it is requested that the Examiner telephone the Applicant's attorney at the number indicated below so that the prosecution of the present case may be advanced by the clarification of any continuing rejection.

Please charge any fees that may be due to Deposit Account 502117, Motorola, Inc.

Respectfully submitted,

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